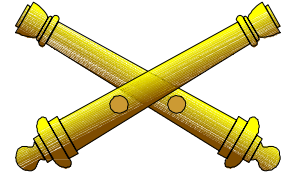


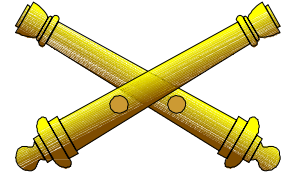
**GUNNERY DEPARTMENT**



# **THE KING OF BATTLE**

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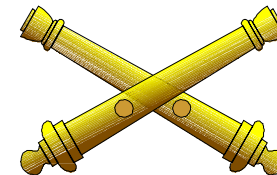
**GUNNERY DEPARTMENT**



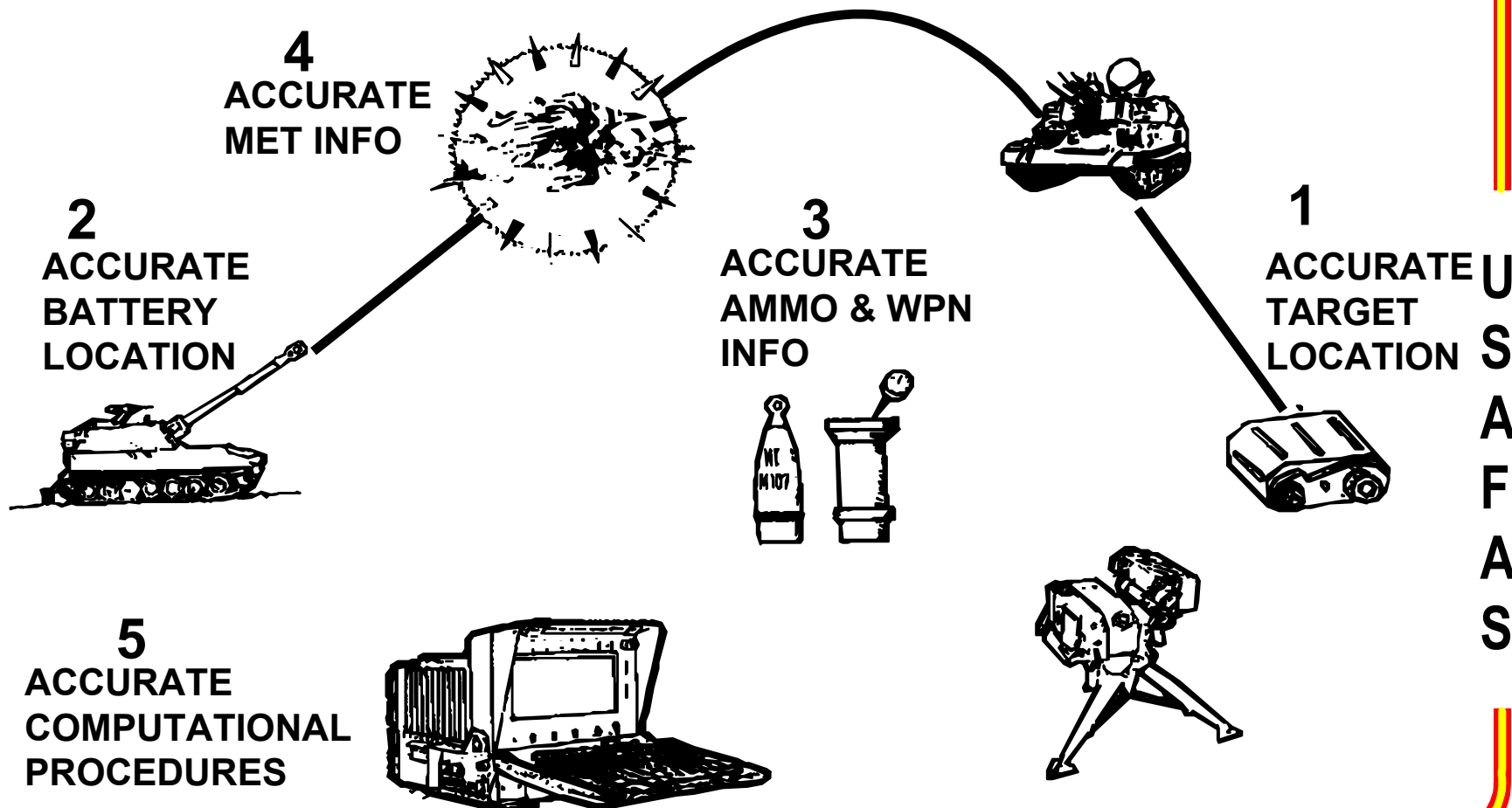
**FIRE CONTROL SYSTEM  
FIELD ARTILLERY  
AN/GYK-37**

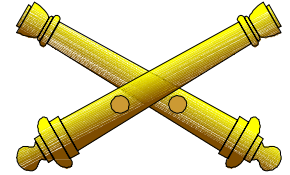
**THE BATTERY COMPUTER SYSTEM  
(BCS)**

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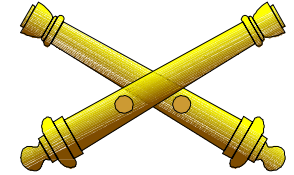
# FIVE REQUIREMENTS FOR ACCURATE PREDICTED FIRE





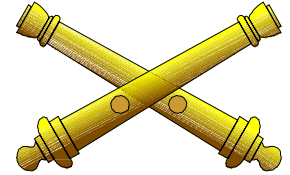
**BCS COMPUTES INDIVIDUAL  
PIECE FIRING DATA USING:**

- **INDIVIDUAL PIECE LOCATION**
- **INDIVIDUAL PIECE AIMPOINT**
- **INDIVIDUAL PIECE MUZZLE VELOCITY  
VARIATIONS**
- **INDIVIDUAL PIECE BALLISTIC  
TRAJECTORIES**



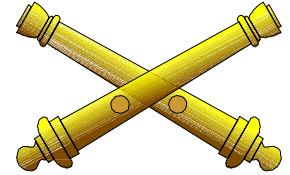
## **MAJOR BCS COMPONENTS**

|   | <u><b>QTY</b></u> |          |
|---|-------------------|----------|
| • <b>LIGHTWEIGHT COMPUTER UNIT (LCU)</b>                              | <b>1</b>          |          |
| • <b>PRINTER</b>  | <b>1</b>          |          |
| • <b>AC/DC CONVERTER CHARGER</b>                                      | <b>1</b>          | <b>U</b> |
| • <b>EXTERNAL TACTICAL COMMUNICATIONS<br/>INTERFACE MODULE (TCIM)</b> | <b>1</b>          | <b>S</b> |
|   |                   | <b>A</b> |
| • <b>GUN DISPLAY UNIT (GDU)</b>                                       | <b>1-12</b>       | <b>F</b> |
|   |                   | <b>A</b> |
|   |                   | <b>S</b> |



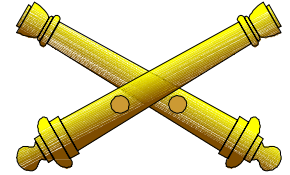
## **BCS FUNCTIONS:**

- **INFORMATION STORAGE**
- **COMPUTATION OF FIRING DATA**
- **TRANSMISSION AND RECEIPT OF HIGH SPEED DIGITAL MESSAGES**
- **DISPLAY OF INFORMATION, RECEIVED MESSAGES, AND FIRE MISSION DATA**
- **COMPOSITION AND EDITING OF MESSAGES**
- **CONDUCTS POWER-ON SELF-TEST**



## **LCU FEATURES**

- **TWO INTERNAL COMMUNICATION CHANNELS THROUGH THE INTERNAL TCIM**
- **REMOVABLE INTERNAL HARD DISK DRIVE**
- **DETACHABLE KEYBOARD**
- **640 X 480 VGA COMPATIBLE 10 INCH LCD SCREEN**
- **25 MHz 80486 32-BIT PROCESSOR**

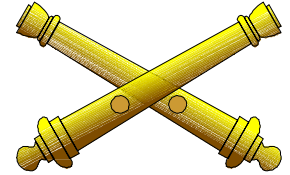


# **LCU FEATURES (CONT)**

- **5 STANDARD FULL-LENGTH EXPANSION SLOTS FOR OPTIONAL SPECIAL PURPOSE BOARDS**
- **INTERNAL 2400 bps MODEM**
- **32 MB RAM**
- **OPERATES FROM 110/220 VAC, RECHARGEABLE NICKEL-CADMIUM BATTERY PACK, OR ALKALINE BATTERIES**
- **2 HOUR OPERATION FROM RECHARGEABLE BATTERY PACK**

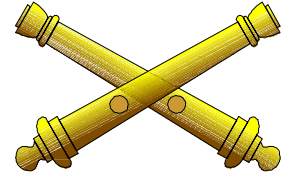
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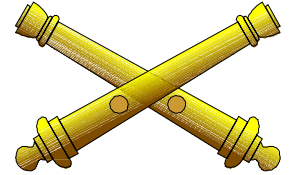
# **EXTERNAL TCIM**

- **COMMUNICATIONS INTERFACE DEVICE USED BY BCS**
- **PROVIDES 2 ADDITIONAL COMMUNICATIONS CHANNELS (CHANNELS 3 & 4) IN ADDITION TO THE TWO CHANNELS PROVIDED BY THE INTERNAL TCIM (CHANNELS 1 AND 2)**
- **HAS A SMALL COMPUTER SYSTEMS INTERFACE (SCSI) SWITCH ON THE FRONT**



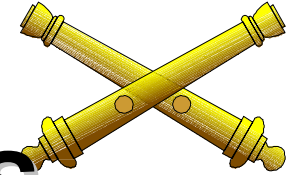
# **PRINTER**

- **USED TO PRINT MESSAGES AUTOMATICALLY OR AS SELECTED BY THE OPERATOR**
- **PRINTS NORMAL TEXT IN DRAFT MODE AND NEAR-LETTER QUALITY MODE**
- **CAN USE CONTINUOUS TRACTOR-FEED PAPER OR SINGLE SHEET PAPER**
- **CAN OPERATE FROM BATTERY PACK**



# **AC/DC CONVERTER/CHARGER**

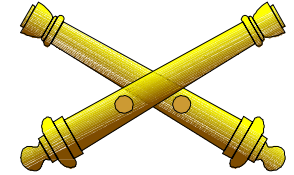
- **DISTRIBUTES AND REGULATES POWER REQUIRED TO OPERATE THE LCU, PRINTER, EXTERNAL TCIM, AND CHARGE THE INSTALLED RECHARGEABLE BATTERY PACK**
- **TAKES 110/220 VAC, 50/60 HZ, OR 16 TO 32 VDC, AND CONVERTS IT TO THE PROPER VOLTAGES FOR POWERING THE ABOVE DEVICES**
- **PROVIDES CONTINUOUS POWER CAPABILITY WHEN SWITCHING TO BATTERY SOURCE IN EVENT OF PRIMARY POWER SOURCE FAILURE**
- **BATTERY CHARGING CIRCUITRY AUTOMATICALLY SENSES CONDITION OF RECHARGEABLE BATTERY PACK**



# **POWER UP PROCEDURES**

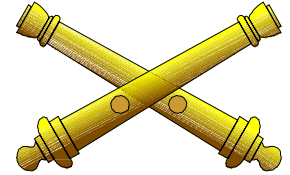
- **ENSURE ALL ATTACHED PERIPHERALS ARE OFF**
- **POWER UP AC/DC CONVERTER CHARGER**
- **TURN ON AND ADJUST RADIOS AND AMPLIFIER/POWER SUPPLY GROUP**
- **IF AVAILABLE, TURN ON PRINTER**
- **IF TO BE USED, TURN ON KY-57 AND COMSEC**
- **TURN ON TCIM**
- **ENSURE HARD DISK DRIVE IS INSTALLED PROPERLY AND NO FLOPPY DISK IS INSTALLED**
- **SET ON/OFF SWITCH ON LCU TO ON**

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# **BCS PERFORMANCE CHARACTERISTICS**

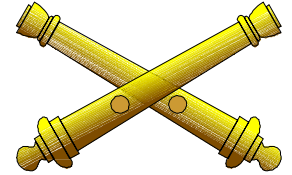
- **CONDUCT OF AREA FIRE MISSIONS**
- **LOCATION OF TARGETS USING GRID, POLAR, LASER POLAR, AND SHIFT FROM A KNOWN POINT**
- **COMPUTATION OF FIRING DATA FOR ALL CURRENT PROJECTILES**
- **CONDUCTS PRECISION, HB/MPI, AND RADAR REGISTRATION MISSIONS**
- **CONDUCTS LASER MISSIONS**
- **CONDUCTS OBSERVER LOCATION PROCESSING (RESECTION, TRILATERATION, AND TRIANGULATION)**



# **BCS PERFORMANCE CHARACTERISTICS**

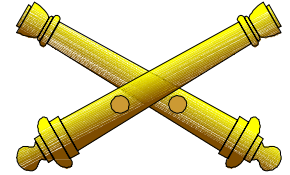
- **CONDUCTS TOT MISSIONS AND EXECUTES FIRE PLANS**
- **PERFORMS ZONE TO ZONE TRANSFORMATION AND REPLOT**
- **CONDUCTS 6 ACTIVE AND 4 PRIORITY MISSIONS**
- **OPERATES WITH AFATDS OR AUTONOMOUSLY**
- **CONDUCTS RELAY OF MESSAGES BETWEEN TWO SUBSCRIBERS**
- **CONDUCTS/CONTROLS MASSING FOR UP TO 5 OTHER UNITS (BCSs)**

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# **BCS CAN STORE**

- **12 HOWITZER LOCATIONS**
- **120 TARGETS/KNOWN POINTS (MAXIMUM OF 99 KNOWN POINTS)**
- **30 OBSERVER LOCATIONS**
- **FSCMs**
- **24 MASKS (MAXIMUM OF 8 PER HOWITZER)**
- **8 SETS OF REGISTRATION CORRECTIONS**

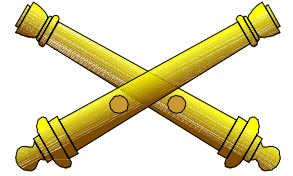


# **BCS CAN STORE**

- **10 COMPUTER MET MESSAGES AND 1 STANDARD COMPUTER MET**
- **4 FIRE PLANS WITH TOTAL MAXIMUM 78 FIRE PLAN TARGETS**
- **100 SUBSCRIBERS**
- **MVV<sub>s</sub> STORED BY HOWITZER, PROJECTILE FAMILY, PROPELLANT TYPE AND LOT**
- **BATTERY AMMUNITION STATUS (UP TO 26 PROJECTILES, 9 PROPELLANTS, AND 26 FUZES)**
- **MAP INFORMATION**
- **RECEIVED MESSAGES**

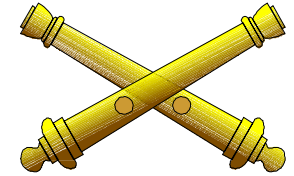
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## **BCS LIMITATIONS**

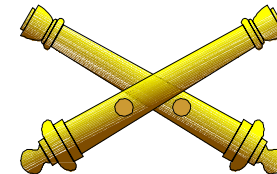
- **ONLY ONE FIRING UNIT, AND ONE AZIMUTH OF FIRE**
- **ENVIRONMENTAL CONCERNS**
- **LANGUAGE/ACCEPTABILITY-  
DOS VS UNIX**



# BCS UPPER DISPLAY

| KEY | TARGET | OB | MSN  | P | PHASE | STATUS | 1 | 2 | 3 | 4 |
|-----|--------|----|------|---|-------|--------|---|---|---|---|
| 1   | BN1046 | 21 | AREA |   | FFE   | WR     |   | A |   |   |
| 2   | AJ4506 | 22 | REG  |   | TIME  | AMC    | A |   |   |   |
| 3   | BN1047 | 71 | AREA |   | ADJ   | WR     |   |   | A |   |

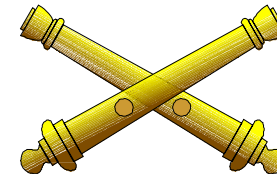
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# BCS MIDDLE DISPLAY

DISPLAYS MESSAGE INDICATOR, CURRENT SYSTEM TIME AND DATE, HOWITZER STATUS, DATA BASE FILES STATUS, INPUT QUEUE STATUS, NUMBER OF SYSTEM WARNINGS, AND SYSTEM DISK UNIT (DU) ACCESS

|           |                       |          |           |            |                                  |
|-----------|-----------------------|----------|-----------|------------|----------------------------------|
| CHK FIRE: | DATE                  | TIME     | :         | DATA/ACK   | <b>U<br/>S<br/>A<br/>F<br/>S</b> |
| FIRE MSN: | 01/JAN/89             | 00:00:00 | :         | POLL/READY |                                  |
| MSG RCVD: | SW IQ FP TKP OB FC DU | :        | FIRE/SHOT |            |                                  |
|           | : 2 4 3               | :        | RDS CMPLT |            |                                  |

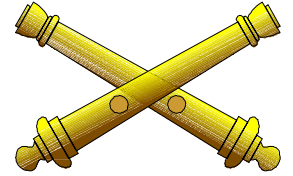


## BCS LOWER DISPLAY

DISPLAYS CURRENT MISSION OR MESSAGE FORMAT

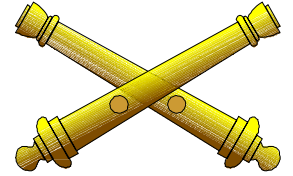
AFU;UPDATE;FU: \_/\_/\_/\_/\_;WPN:155MM;MODEL:M198;MSN:\_\_\_;ZONE:\_\_\_\_\_;  
CORD:\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_;GZ:\_\_\_;DTG:\_\_\_/\_\_\_/\_\_\_;  
APL: \_/\_/\_;WSTR:\_\_\_;AZ:\_\_\_\_;RT:\_\_\_;RS:\_\_\_;TRAVLR:\_\_\_\_/\_\_\_\_;  
MINRNG:\_\_\_\_;MAXRNG: \_/\_\_\_\_, \_/\_\_\_\_, \_/\_\_\_\_, \_/\_\_\_\_, \_/\_\_\_\_;  
READY:\_\_\_;OUTTIL:\_\_\_/\_\_\_/\_\_\_;  
PTEMP:\_\_\_\_;MAXEL:\_\_\_\_;ST:\_\_\_;DF:\_\_\_\_;FULAT:\_\_\_\_.\_\_\_\_;  
ORSTA:\_\_\_\_/\_\_\_\_/\_\_\_\_;ORSTBGZ:\_\_\_\_;  
ORSTB:\_\_\_\_/\_\_\_\_/\_\_\_\_;ORSTAGZ:\_\_\_\_;

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# **POWER DOWN PROCEDURES**

- **RETURN TO MAIN INDEX AND SELECT “9”  
(SYSTEM SHUTDOWN)**
- **FOLLOW INSTRUCTIONS ON BCS SCREEN**
- **TURN OFF PERIPHERAL EQUIPMENT FIRST**
- **TURN OFF MAIN BCS POWER SWITCH**



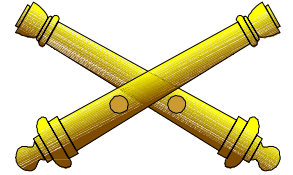
# **GUN DISPLAY UNIT (GDU)**

## **FUNCTIONS:**

1. **RECEIVES FIRING DATA FROM THE BCS AND  
DISPLAYS IT TO THE HOWITZER CREW**
2. **RESPONDS TO BCS STATUS POLLS**

## **MAJOR COMPONENTS:**

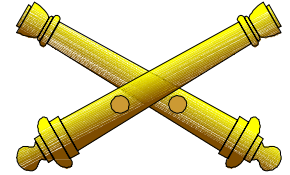
1. **CASE ASSEMBLY**
2. **SECTION CHIEF ASSEMBLY**
3. **TWO GUN ASSEMBLIES**



# **CASE ASSEMBLY**

- **PROVIDES AN INTERFACE FOR EXTERNAL POWER APPLICATION**
- **MOUNTS A NON-RECHARGEABLE, LITHIUM, BA5590/U BATTERY FOR INTERNAL POWER APPLICATION**
- **PROVIDES AN INTERFACE FOR DATA RECEPTION AND TRANSMISSION**
- **CONTAINS CONTROLS FOR GDU OPERATION**
- **SOUNDS AN ALARM UPON RECEIPT OF FIRING DATA**

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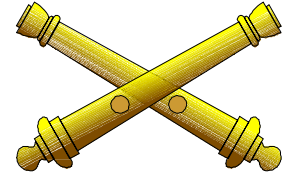
## **SECTION CHIEF'S ASSEMBLY**

**DISPLAYS FIRING DATA RECEIVED FROM THE BCS**

- **MISSION TYPE**
- **SPECIAL INSTRUCTIONS**
- **SHELL TYPE AND LOT**
- **POWDER LOT**
- **CHARGE**
- **FUZE**
- **FUZE SETTING**
- **DEFLECTION**
- **QUADRANT ELEVATION**
- **METHOD OF CONTROL**
- **FFE AMMUNITION**

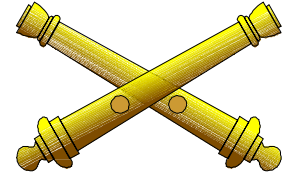
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## **SECTION CHIEF'S ASSEMBLY**

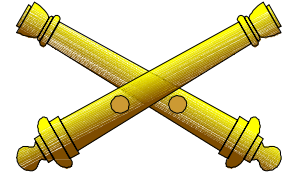
- **TRANSMITS HOWITZER STATUS TO THE BCS**
  - **MANUAL ACKNOWLEDGEMENT**
  - **SHOT**
  - **ROUNDS COMPLETE**
  - **READY**
- **CONDUCTS SELF DIAGNOSTIC TEST FOR FAULT DETECTION**



## **SECTION CHIEF'S ASSEMBLY**

### **FEATURES:**

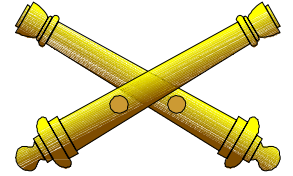
- **LED DIGITAL DISPLAY**
- **SELECTIVE OR SEQUENTIAL DISPLAY OF FIRING DATA**
- **POWER CONSERVING DISPLAY CUT-OFF**



# **GUN ASSEMBLIES**

## **FUNCTIONS:**

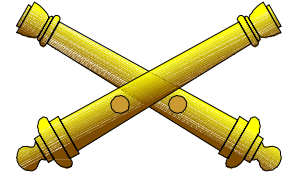
- **DISPLAYS DEFLECTION IF CONNECTED TO THE DEFLECTION BINDING POSTS OF THE CASE ASSEMBLY**
- **DISPLAYS QUADRANT ELEVATION IF CONNECTED TO THE QE BINDING POSTS OF THE CASE ASSEMBLY**



# **GUN ASSEMBLIES**

## **FEATURES:**

- LED DIGITAL DISPLAY
- POWER CONSERVING DISPLAY CUT-OFF
- DISPLAY RECALL

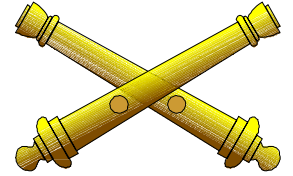


# **BCS MANUALS**

- **TB 11-7025-293-10-1: CANNON BATTERY COMPUTER SYSTEM SOFTWARE FOR FIRE CONTROL SYSTEM AN/GYK-37**
- **TB 11-7025-293-10-2: CANNON BATTERY COMPUTER SYSTEM SOFTWARE FOR FIRE CONTROL SYSTEM AN/GYK-37**
- **TM 11-7440-283-12-2: GDU OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL**
- **BCS SPECIAL TEXT (ST 6-40-3)**
- **TM 11-7021-217-12&P: OPERATOR AND UNIT MAINTENANCE MANUAL**

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**GUNNERY DEPARTMENT**



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